

Non-Destructive Detection and Separation of Radiation Damaged Cells in Miniaturized, Inexpensive Device, Phase II

Completed Technology Project (2009 - 2012)



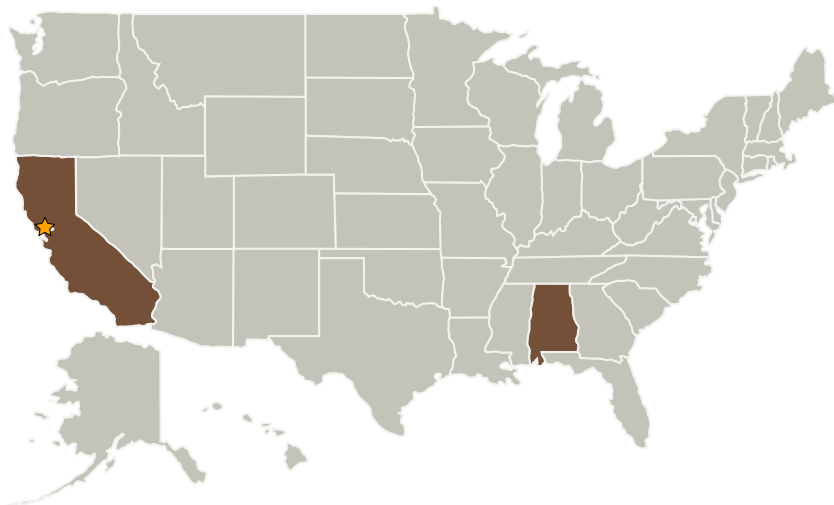
Project Introduction

Our objective is to develop and demonstrate a novel microfluidic device for non-destructive identification, sorting and counting of radiation damaged cells. A major thrust, using microarray experiments, is the discovery of unique cell surface markers for identification of radiation-damaged cells.

Anticipated Benefits

The end product of the proposed SBIR effort will be a first-of-its-kind, commercially available, compact, low-cost, integrated device for sorting of radiation damaged cells. This device will greatly aid in NASA's efforts to minimize radiation hazard, and develop countermeasures, enabled by fundamental understanding of radiation biological effects at the molecular and cellular level. The device will be of direct use to NASA's ground-based research facilities and amenable for space deployment as well (in-situ gene expression studies in space). In addition, the technology can easily be modified to benefit research efforts focused on other space-induced biological phenomena such as bone loss, immune modulation, oxidative stress among others. It is also expected that the developed technology will find ready applications in the following civilian markets: ? Pharmaceutical and Drug Discovery Companies ? Pre-clinical and Clinical Researchers (in particular stem cell and oncology researchers) ? Hospital & Health Site Monitoring (for nuclear medicine, immune ex-vivo treatments)

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Areas	2

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
CFD Research Corporation	Supporting Organization	Industry	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	California

Project Transitions

**September 2009:** Project Start**December 2012:** Closed out

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Gary C Jahns

Principal Investigator:

Shankar Sundaram

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.5 Radiation
 - └ TX06.5.1 Radiation Transport and Risk Modeling